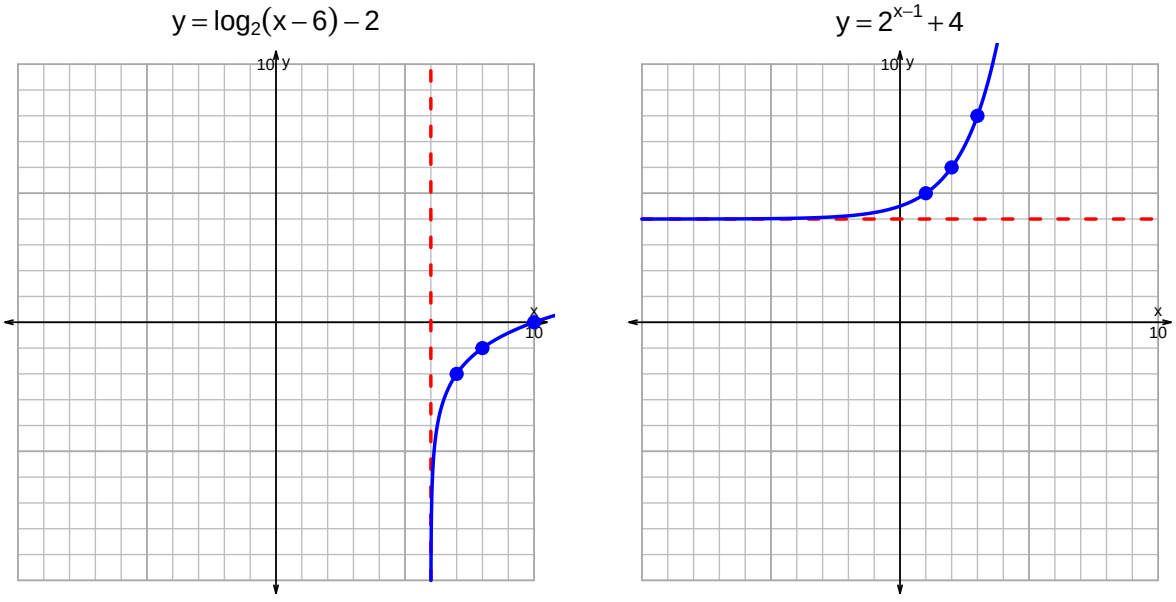
Name: Date:

## s18: EXP LOG (SLTN v305)

1. (10 pts) Graph $y = \log_2(x-6) - 2$ and $y = 2^{x-1} + 4$ on the grids below. Also, draw any asymptotes with dashed lines.




*Somewhat useful hint:* $2^3 = 8$, *and thus* $\log_2(8) = 3$.

2. (10 pts) Write (but do not evaluate) the solution to the equation below by writing a logarithmic expression. Please do not do any arithmetic; just move numbers around.

$$-11 = \left(\frac{-4}{5}\right) \cdot 2^{7t/3}$$

Divide both sides by $\frac{-4}{5}$.

$$\frac{11 \cdot 5}{4} = 2^{7t/3}$$

Take log, base 2, of both sides.

$$\log_2\left(\frac{11 \cdot 5}{4}\right) = \frac{7t}{3}$$

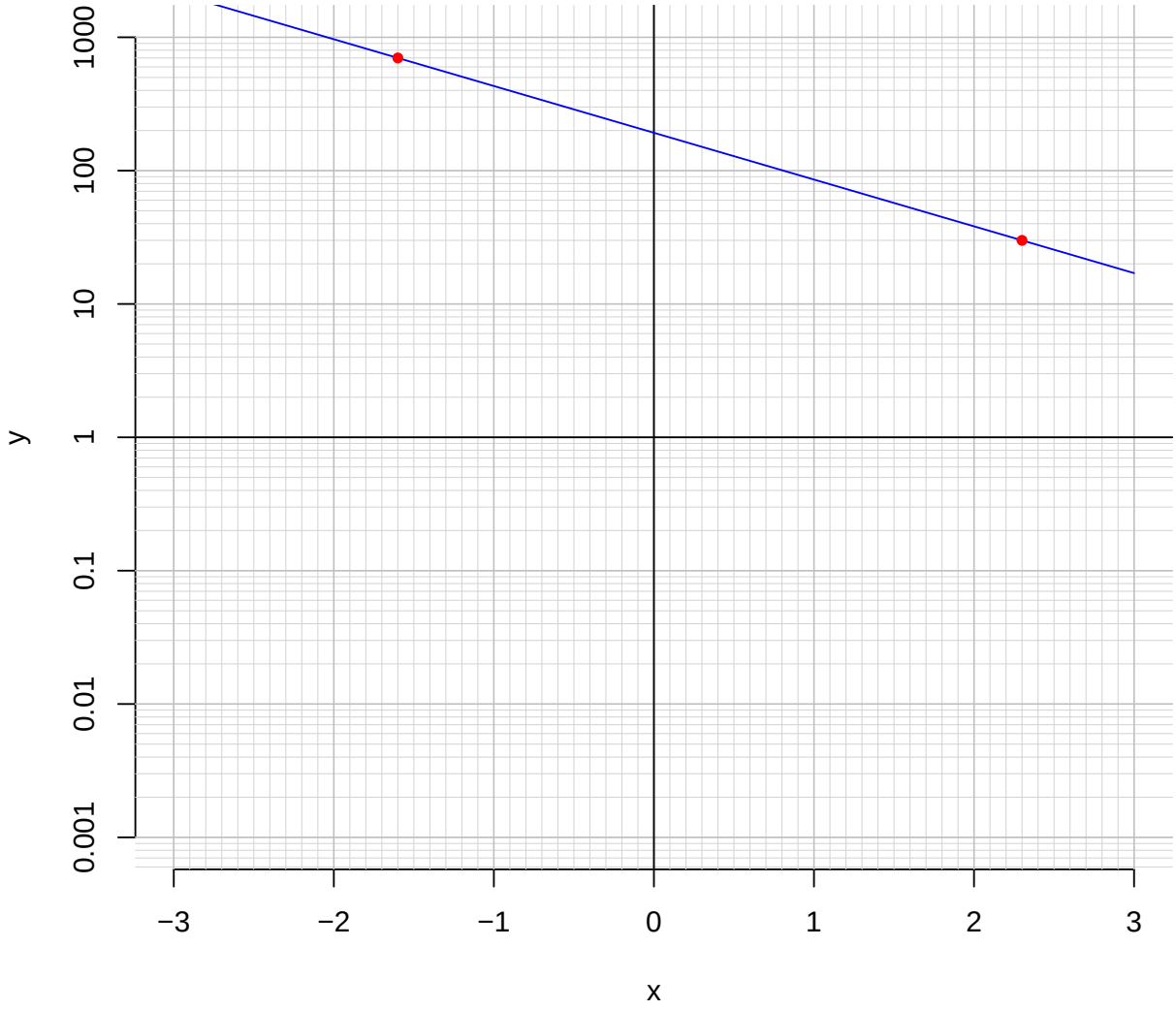
Divide both sides by $\frac{7}{3}$.

$$\frac{3}{7} \cdot \log_2\left(\frac{11 \cdot 5}{4}\right) = t$$

Switch sides.

$$t = \frac{3}{7} \cdot \log_2\left(\frac{11 \cdot 5}{4}\right)$$

3. (10 pts) An exponential function $f(x) = 192 \cdot e^{-0.808x}$ is graphed below on a semi-log plot.




a. Using the plot above, evaluate $f(2.3)$.

$$f(2.3) = 30$$

b. The inverse function is logarithmic.

$$f^{-1}(x) = \frac{-1}{0.808} \cdot \ln\left(\frac{x}{192}\right)$$

Using the plot above, evaluate $f^{-1}(700)$.

$$f^{-1}(700) = -1.6$$